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# GUIDELINE FOR CRITICAL CARE OF SERIOUSLY ILL ADULT PATIENTS WITH CORONAVIRUS (COVID-19) IN THE AMERICAS

SHORT VERSION – V1

APRIL 3th 2020

## NOTE

This document is the result of a rapid guideline adaptation process. The information presented reflects published evidence as of the date of inclusion in the document. The recommendations are based on the evidence available and the quality thereof (GRADE methodology) at the time the guidelines were published. However, PAHO recognizes that there are numerous clinical trials under way and will periodically update these reviews and the applicable recommendations.

# **GUIDELINE FOR CRITICAL CARE OF SERIOUSLY ILL ADULT PATIENTS WITH CORONAVIRUS (COVID-19) IN THE AMERICAS**

## **OBJECTIVE AND TARGET POPULATION**

This clinical practice guideline was developed in order to provide recommendations for the management of critically ill adult patients with COVID-19 in intensive care units (ICUs).

The target population is critically ill adult patients with a suspected or confirmed diagnosis of COVID-19. WHO defines a complicated case as one requiring respiratory support and/or monitoring/management in an ICU for any patient with the following: (WHO, 2020)

- $FiO_2/PaO_2 \geq 250$ , or 2.
- Chest x-ray with bilateral patchy infiltrates
- Respiration rate  $\geq 30$  or oxygen saturation  $\leq 90\%$

## **SCOPE AND USERS**

This clinical practice guideline provides evidence-informed recommendations for infection control, specimen collection, supportive care, pharmacological treatment, and prevention of complications.

The recommendations are directed to all health care staff who deal with patients in emergency departments and ICUs (physicians specializing in emergency medicine, pulmonology, intensive care medicine, internal medicine, anesthesiology, infectious disease, inhalation therapists, nurses, pharmaceutical chemists). These guidelines are intended for use by decision-makers and government entities involved in the management of patients with COVID-19 in ICUs in the Region of the Americas.

These guidelines do not address questions related to nutrition, physical therapy, or management of complications.

## METHODOLOGY

This guideline follows the GRADE (grading of recommendations assessment, development, and evaluation) approach for rapid adaptation of the guidelines proposed by PAHO: *Strengthening national evidence-informed guideline programs. A tool for adapting and implementing guidelines in the Americas*. Washington, D.C.: PAHO; 2018.

A multidisciplinary development group was formed, informed by experts in critical care medicine, emergency medicine, infectious disease, anesthesiology, pediatrics, pulmonology, epidemiology, and public health. Experts from the Pan American Health Organization were responsible for technical and methodological coordination. After the process of selecting and evaluating guidelines, the World Health Organization guideline entitled *Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected*, published on 13 March 2020 (WHO, 2020), and the guideline *Surviving Sepsis Campaign: Guidelines on the Management of Critically Ill Adults with Coronavirus Disease (COVID-19)* were selected as a basis for the adaptation process, and evidence on COVID-19 was added. A virtual panel of Ibero-American experts was convened to formulate recommendations, considering the context for regional implementation. All members of the development group signed conflict of interest forms, which were reviewed by the guideline coordinators. Details of the methodology are found in the long version of the guideline.

## CONTINUOUS UPDATING OF GUIDELINES

The evidence underpinning these guidelines is being continuously updated in order to provide the most up-to-date recommendations for the management of critically ill patients with COVID-19, with particular attention to pharmacological treatment interventions such as the use of antivirals, corticosteroids, convalescent plasma, antibiotics, chloroquine, and hydroxychloroquine, among other interventions. This means that this is a *“living guideline”*.

## RECOMMENDATIONS

### How to use these guidelines

For each clinical question, a set of recommendations and good practices provides guidance for the management of critically ill patients with COVID-19.

Each recommendation shows the quality of the evidence based on the GRADE system:

Grade	Meaning
<b>High</b> ⊕⊕⊕⊕	Further research is very unlikely to change our confidence in the estimate of effect.
<b>Moderate</b> ⊕⊕⊕○	Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
<b>Low</b> ⊕⊕○○	Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
<b>Very low</b> ⊕○○○	Any estimated of effect is very uncertain.

The recommendations also indicate the strength of the recommendation based on the GRADE system:

Strength of recommendation	Meaning
<b>Strong</b>	Should be used. New evidence is unlikely to change the recommendation. <b>RECOMMENDED</b>
<b>Conditional</b>	Could be used. New evidence may change the recommendation. <b>SUGGESTED</b>

## Recommendations

*These recommendations are subject to review as new evidence becomes available.*

### WHAT TRIAGE STRATEGY SHOULD BE USED FOR CRITICALLY ILL PATIENTS WITH COVID-19?

Strength of recommendation	No.	Summary
Best practice statement	√	Institutional protocols for triage of patients with a suspected or confirmed diagnosis of COVID-19 should be implemented in order to appropriately classify patients who require management in an intensive care unit (ICU).

### HOW SAFE AND EFFECTIVE ARE INTERVENTIONS TO PREVENT INFECTION OF HEALTH PROFESSIONALS WHO CARE FOR PATIENTS WITH COVID-19 IN INTENSIVE CARE UNITS?

Strength of recommendation	No.	Summary
Best practice statement	√	<p>For health care workers in contact with patients with COVID-19 who perform aerosol-generating* procedures in the ICU or who work in a unit in which such procedures are performed without adequate ventilation or an independent negative pressure system, it is recommended that fitted respirator masks (N-95 respirator masks, FFP2, or equivalent) be used, as opposed to surgical masks, in addition to other personal protective equipment (gloves, gown, and eye protection such as a face shield or safety goggles).</p> <p><i>* Aerosol-generating procedures in the ICU include: endotracheal</i></p>

		<p><i>intubation, bronchoscopy, open suctioning, nebulized treatment, manual ventilation before endotracheal intubation, physical proning of the patient, disconnecting the patient from the ventilator, non-invasive positive pressure ventilation, tracheostomy, and cardiopulmonary resuscitation.</i></p>
<b>Best practice statement</b>	v	<p>Aerosol-generating procedures performed on patients with COVID-19 in the ICU should be carried out in areas designated for that purpose and the best available measures for limiting contamination of other patients or health care workers should be implemented. If a negative pressure room is not available, an area with natural ventilation should be designated in all patient care areas.</p>
<b>Best practice statement</b>	v	<p>For natural ventilation, the following minimum hourly averaged ventilation rates are recommended:</p> <ul style="list-style-type: none"> <li>• 160 l/s/patient (hourly average ventilation rate) for airborne precaution rooms (with a minimum of 80 l/s/patient)</li> <li>• When patient care is undertaken in corridors during emergency or other situations, the same ventilation rate requirements for airborne precaution rooms apply.</li> <li>• When natural ventilation alone cannot satisfy the recommended ventilation requirements, alternative ventilation systems, such as hybrid (mixed-mode) natural ventilation should be considered. If that is not enough, mechanical ventilation should be used.</li> </ul>
<b>Conditional</b>	1	<p>For health care workers providing care to non-mechanically ventilated COVID-19 patients in the ICU, surgical masks should be used rather than respirator masks, in addition to other personal protective equipment.</p>

		<b>Quality of the evidence: Low ⊕⊕○○</b>
<b>Conditional</b>	2	<p>For health care workers performing non-aerosol-generating procedures on mechanically ventilated (closed-circuit) patients with COVID-19, surgical/medical masks should be used rather than respirator masks, in addition to other personal protective equipment</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<b>Conditional</b>	3	<p>For health care workers performing endotracheal intubation on patients with COVID-19, video-guided laryngoscopy or direct laryngoscopy should be used according to availability.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<b>Best practice statement</b>	v	<p>For health care workers performing endotracheal intubation on COVID-19 patients, intubation should be performed by the health professional most experienced with airway management, following institutional protocols to minimize the number of attempts and the risk of transmission.</p>

**HOW SHOULD SPECIMENS BE COLLECTED FOR THE DIAGNOSIS OF COVID-19 IN PATIENTS REQUIRING INTUBATION AND MECHANICAL VENTILATION IN INTENSIVE CARE UNITS?**

Strength of the Recommendation	No.	Summary
<b>Conditional</b>	4	<p>For adult patients with suspicion of COVID-19 that need to be intubated and mechanically ventilated</p> <ul style="list-style-type: none"> <li>• For diagnostic testing, specimens should be obtained from the lower respiratory tracts (at the time of intubating or as close as possible), rather than obtaining samples from the upper respiratory tract (nasopharyngeal or oropharyngeal samples).</li> <li>• For lower respiratory samples, endotracheal aspirates should be obtained preferably over bronchial lavage or bronchoalveolar lavage samples.</li> <li>• <b>Quality of the evidence: Low ⊕⊕○○</b></li> </ul>
<b>Best practice statement</b>	v	<p>Rapid collection and testing of specimens from patients with suspected COVID-19 should be a priority and should be carried out by experts in accordance with biosafety recommendations. It is recommended that the laboratory procedure for endotracheal aspirates be institutionally validated in order to avoid false negatives.</p> <p>Extensive testing should be conducted in accordance with needs to confirm 2019-nCoV and possible coinfections. Institutional guidelines for obtaining informed consent for specimen collection, testing, and future research should be followed.</p>



**WHAT ARE THE SAFETY AND EFFICACY OF RESPIRATORY SUPPORT INTERVENTIONS FOR CRITICALLY ILL PATIENTS WITH COVID-19 IN INTENSIVE CARE UNITS?**

Strength of the Recommendation	No.	Summary
Strong	5	<p>In patients with COVID-19 with acute respiratory distress syndrome (ARDS) and respiratory failure, hypoxemia or shock (who are not intubated or receiving mechanical ventilation), we recommend that supplementary oxygen be given immediately until SpO<sub>2</sub> is ≥94%.</p> <p><b>Quality of the evidence: Moderate ⊕⊕⊕○</b></p>
Strong	6	<p>For adults with COVID-19 and acute hypoxemic respiratory failure who are receiving oxygen, we recommend that SpO<sub>2</sub> be maintained at no higher than 96%.</p> <p><b>Quality of the evidence: Moderate ⊕⊕⊕○</b></p>
Best practice statement	v	<p>High-flow nasal cannulae (HFNC) and non-invasive ventilation (NIMV) should be used in units where patients with suspected or confirmed COVID-19 are hospitalized only if the area is adequately ventilated or has a negative pressure system and if all staff in the area use correct airborne precautions. If this is not possible, it is preferable to use mechanical ventilation with orotracheal intubation.</p>
Strong	7	<p>In mechanically ventilated adults with COVID 19 and ARDS, it is recommended to use low tidal volume ventilation (4–8 mL/kg of predicted body weight) and to maintain <i>plateau</i> pressures below 30 cm H<sub>2</sub>O.</p> <p><b>Quality of the evidence: Moderate ⊕⊕⊕○</b></p>

<p><b>Conditional</b></p>	<p>8</p>	<p>For mechanically ventilated adult patients with COVID-19 and ARDS, a conservative strategy of positive end-expiratory pressure (PEEP) should be applied to prevent barotrauma.</p> <p><i>(If using a higher PEEP strategy, personnel should monitor patients who do not respond to higher PEEP levels for barotrauma).</i></p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<p><b>Strong</b></p>	<p>9</p>	<p>For mechanically ventilated adults with COVID-19 and ARDS, using a conservative fluid strategy is recommended, as opposed to a liberal fluid strategy.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<p><b>Conditional</b></p>	<p>10</p>	<p>For mechanically ventilated adults with COVID-19 and moderate to severe ARDS, prone ventilation for 12 to 16 hours is suggested, as opposed to non-prone ventilation. This will require sufficient human resources and expertise to carry out the procedure safely and in a standardized manner. Pregnant women may benefit from being placed in a lateral position.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<p><b>Conditional</b></p>	<p>11</p>	<p>For mechanically ventilated adults with COVID-19 and moderate to severe ARDS who are in need of mechanical ventilation:</p> <ul style="list-style-type: none"> <li>• Intermittent boluses of neuromuscular blocking agents (NMBA) are suggested, as opposed to continuous NMBA infusion, in order to facilitate protective lung ventilation.</li> <li>• In the event of persistent ventilator dyssynchrony and need for ongoing deep sedation, prone ventilation, or persistently high plateau pressures, we suggest using a continuous NMBA infusion for up to 48 hours.</li> </ul> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<p><b>Strong</b></p>	<p>12</p>	<p>In mechanically ventilated adults with COVID 19 and ARDS, the use</p>

		<p>of inhaled nitric oxide is not recommended.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<b>Strong</b>	13	<p>For mechanically ventilated adults with COVID 19 and refractory hypoxemia despite optimized ventilation, the use of recruitment maneuvers is recommended; incremental PEEP (gradual increases in PEEP) is not recommended.</p> <p><b>Quality of the evidence: Moderate ⊕⊕⊕○</b></p>
<b>Conditional</b>	14	<p>It is suggested that extracorporeal membrane oxygenation (ECMO), if available, or on referral of patients to an ECMO center be applied in the following cases of critically ill patients with COVID-19 and severe ARDS:</p> <ul style="list-style-type: none"> <li>• Mechanically ventilated patients with COVID 19 and refractory hypoxemia who do not respond to recommended therapeutic alternatives (ventilation optimization, use of rescue therapies, and prone ventilation)</li> </ul> <p>It is suggested that ECMO not be used for the following patients:</p> <ul style="list-style-type: none"> <li>• Patients with terminal disease or central nervous system damage, patients with do-not-resuscitate orders or who refuse ECMO</li> <li>• Patients with significant comorbidities</li> <li>• Patients over 65 years of age</li> <li>• Patients who have been on mechanical ventilation for more than 7 days</li> </ul> <p><b>Quality of the evidence: Very low ⊕○○○</b></p>

**WHAT ARE THE EFFICACY AND SAFETY OF HEMODYNAMIC SUPPORT INTERVENTIONS FOR CRITICALLY ILL PATIENTS WITH COVID-19 IN THE INTENSIVE CARE UNIT?**

<b>Strength of Recommendation</b>	<b>No.</b>	<b>Summary</b>
<b>Conditional</b>	15	For the acute resuscitation of adults with COVID 19 and shock,

		<p>a conservative fluid strategy is suggested, rather than a liberal strategy.</p> <p><b>Quality of the evidence: Very low ⊕○○○</b></p>
<b>Conditional</b>	16	<p>In adults with COVID 19 and shock, various dynamic parameters should be used to assess fluid responsiveness. The following may be useful: stroke volume variation, pulse pressure variation, skin temperature, capillary refilling time, and/or serum lactate measurement.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<b>Strong</b>	17	<p>For the acute resuscitation of adults with COVID 19 and shock, the administration of 250–500 ml of a crystalloid solution is recommended, rather than a colloid solution. Crystalloid solutions include normal saline solution and Ringer’s lactate.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<b>Conditional</b>	18	<p>For the acute resuscitation of adults with COVID 19 and shock, buffered/balanced crystalloids should be used, if available, rather than unbalanced crystalloids. Balanced crystalloid solutions include lactate solution, Hartmann’s solution, and other multi-electrolytic solutions.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<b>Strong</b>	19	<p>For the acute resuscitation of adults with COVID 19 and shock, we recommend against the use of hydroxyethyl starches, gelatins, or dextrans.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<b>Conditional</b>	20	<p>For the acute resuscitation of adults with COVID 19 and shock, we suggest against the routine use of albumin.</p>

Quality of the evidence: Low ⊕⊕○○

**WHAT IS THE SAFETY AND EFFICACY OF VASOPRESSORS AND CORTICOSTEROIDS FOR THE TREATMENT OF CRITICALLY ILL PATIENTS WITH COVID-19 IN SHOCK?**

Strength of Recommendation	No.	Summary
Conditional	21	<p>For adults with COVID19 and shock, we suggest the use of norepinephrine as the first-line vasoactive agent, rather than other agents.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
Conditional	22	<p>For adults with COVID-19 and shock, if norepinephrine is not available, we suggest either vasopressin or epinephrine be used as the first-line vasoactive agent, rather than other vasoactive agents.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
Strong	23	<p>For adults with COVID-19 and shock, we recommend against the administration of dopamine, given its low safety profile compared with the other vasopressors.</p> <p><b>Quality of the evidence: Moderate ⊕⊕⊕○</b></p>
Conditional	24	<p>For adults with COVID 19 and shock, titrating vasoactive agents should be used to achieve a mean arterial pressure (MAP) of 60–65 mmHg, rather than higher MAP targets.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
Conditional	25	<p>For adults with COVID 19 and shock, we suggest adding vasopressin as a second-line agent if the target mean arterial pressure (MAP) cannot be achieved by norepinephrine alone.</p>

		<b>Quality of the evidence: Moderate ⊕⊕⊕○</b>
<b>Conditional</b>	26	<p>For adults with COVID 19 and shock with evidence of cardiac dysfunction and persistent hypoperfusion despite fluid resuscitation and norepinephrine, we suggest adding dobutamine (with prior echocardiography), rather than increasing the norepinephrine dose.</p> <p><b>Quality of the evidence: Very low ⊕○○○</b></p>
<b>Conditional</b>	27	<p>For adults with COVID-19 and shock who require the addition of a second vasopressor, low-dose corticosteroid therapy is suggested.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<b>Best practice statement</b>	v	<p>Vasopressors should be administered when shock persists during or after fluid resuscitation to achieve target MAP and improve perfusion markers. If central venous catheters (CVC) are not available, vasopressors can be administered through a peripheral intravenous catheter (for a short time, at low doses), using a large vein and closely monitoring for signs of extravasation and tissue necrosis, until a CVC can be placed. Whenever possible, a CVC should be inserted in the first 24–48 hours of vasopressor use.</p>

**WHAT ARE THE SAFETY AND EFFICACY OF PHARMACOLOGICAL INTERVENTIONS FOR THE TREATMENT OF CRITICALLY ILL PATIENTS WITH COVID-19 IN INTENSIVE CARE UNITS?**

<b>Strength of the Recommendation</b>	<b>No.</b>	<b>Summary</b>
<b>Conditional</b>	28	In mechanically ventilated adults with COVID-19 and respiratory failure (without ARDS), we suggest against the use of systemic

		<p>corticosteroids.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<b>Best practice statement</b>	√	<p>There is insufficient evidence to make a recommendation on the use of systemic corticosteroids in adult patients with COVID-19 and ARDS.</p>
<b>Conditional</b>	29	<p>In mechanically ventilated patients with COVID-19 and respiratory failure, empiric antimicrobials/antibacterial agents should be used for 5 to 7 days, following institutional protocols and considering the clinical diagnosis (for example, community-acquired pneumonia, sepsis) and local data on bacterial resistance.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<b>Best practice statement</b>	√	<p>The administration of antibiotics should be initiated within an hour of assessing the patient. Antibiotic therapy should be deescalated on the basis of microbiological results and clinical judgment.</p>
<b>Conditional</b>	30	<p>In adults with COVID-19 who develop fever, we suggest that drugs should be used for temperature control. The choice of drug will depend on each patient’s comorbidities.</p> <p><b>Quality of the evidence: Low ⊕⊕○○</b></p>
<b>Conditional</b>	31	<p>In adults with COVID-19, the routine use of standard intravenous immunoglobulins is not suggested</p> <p><b>Quality of the evidence: Very low ⊕○○○</b></p>
<b>Best practice statement</b>	√	<p>There is no quality evidence to support a recommendation on the use of convalescent plasma in adult patients with COVID-19. The effectiveness of this intervention is being evaluated in various</p>

		<p>randomized clinical trials.</p> <p><b>Quality of the evidence: Very low ⊕○○○</b></p>
<b>Best practice statement</b>	√	<p>There is no quality evidence to support a recommendation on the use of antiviral agents in adult patients with COVID-19. The effectiveness of these drugs is being evaluated in various randomized clinical trials.</p>
<b>Best practice statement</b>	√	<p>There is no quality evidence to support a recommendation on the administration of recombinant interferons, alone or in combination with antivirals, in adult patients with COVID-19. The effectiveness of these drugs is being evaluated in various randomized clinical trials.</p>
<b>Best practice statement</b>	√	<p>There is no quality evidence to support a recommendation on the use of chloroquine or hydroxychloroquine in adult patients with COVID-19. The effectiveness of these drugs is being evaluated in various randomized clinical trials.</p>
<b>Best practice statement</b>	√	<p>There is no quality evidence so support a recommendation on the use of tocilizumab in adult patients with COVID-19. The effectiveness of these drugs is being evaluated in various randomized clinical trials.</p>

**WHAT ARE THE GUIDELINES FOR PREVENTION OF COMPLICATIONS ASSOCIATED WITH THE TREATMENT OF CRITICALLY ILL PATIENTS WITH COVID-19?**

<b>Strength of the Recommendation</b>	<b>No.</b>	<b>Summary</b>
<b>Best practice statement</b>	√	<p>The following interventions are recommended to prevent complications associated with the management of adult patients</p>



with COVID-19:

**Reduce the incidence of ventilator-associated pneumonia**

- Use an institutional protocol for ventilator weaning that includes daily assessment.
- Oral intubation is preferable to nasal intubation in adolescents and adults.
- Keep the patient in a semi-recumbent position (head elevation of 30°–45°).
- Use a closed suctioning system; periodically drain and discard condensate in tubing.
- Use a new ventilator circuit for each patient; once the patient is ventilated, change the circuit if soiled or damaged, but not routinely.
- Change the heat moisture exchanger when it malfunctions, when soiled, or every 5–7 days.

**Reduce the incidence of venous thromboembolism**

- Use pharmacological prophylaxis (low molecular weight heparin if available, or 5,000 units of heparin subcutaneously twice a day) in adolescents and adults without contraindications. For those with contraindications, use mechanical prophylaxis (intermittent pneumatic compression devices).

**Reduce the incidence of blood infections associated with intravenous devices**

- Use a checklist as a reminder of each step needed for sterile insertion and as a daily reminder to remove the intravenous device if no longer needed.

**Reduce the incidence of pressure ulcers**

- Turn the patient every two hours.

**Reduce the incidence of stress ulcers and gastrointestinal bleeding**

- Give early enteral nutrition (within 24–48 hours of admission).
- Actively mobilize the patient early in the course of the illness when safe to do so.

**Reduce the risk of delirium**

- Use protocols for prevention, continuous monitoring, and management of delirium
- Use nonpharmacological interventions to prevent and treat delirium (reorientation, schedules, clocks, natural lighting, reduce ambient noise, facilitate sleep, avoid drugs with deliriogenic potential, etc.)
- Use pharmacological interventions to treat delirium.

**Quality of the evidence: Very low ⊕○○○**

## WHO \PAHO GUIDELINES RELATD TO COVID-19

### USE OF PROTECTIVE EQUIPMENT

Requirements and technical specifications of personal protective equipment (PPE) for the novel coronavirus (2019-ncov) in healthcare settings

<https://www.paho.org/en/file/59297/download?token=br2NtqhR>

Technical specifications of medical devices for the case management of COVID-19 in healthcare settings

<https://www.paho.org/en/documents/technical-specifications-medical-devices-case-management-covid-19-healthcare-settings>

Presentation: Infection Prevention and Control and new coronavirus (COVID-19): standard precautions and use of personal protective equipment

<https://www.paho.org/en/documents/presentation-infection-prevention-and-control-and-novel-coronavirus-covid-19-standard>

Interim laboratory biosafety guidelines for the handling and transport of samples associated with the novel coronavirus 2019 (2019-nCoV)

<https://www.paho.org/en/documents/interim-laboratory-biosafety-guidelines-handling-and-transport-samples-associated-novel>

Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected

[https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-\(nCoV\)-sc8infection-is-suspected-20200125](https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(nCoV)-sc8infection-is-suspected-20200125)

Natural ventilation for infection control in healthcare settings

[http://whqlibdoc.who.int/publications/2009/9789241547857\\_eng.pdf](http://whqlibdoc.who.int/publications/2009/9789241547857_eng.pdf)

### DIAGNOSIS OF COVID-19

Coronavirus disease (COVID-19) technical guidance: Laboratory testing for 2019-nCoV in humans

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance>

Laboratory testing for 2019 new coronavirus (2019-nCoV) in suspected human cases

<https://www.who.int/publications-detail/laboratory-testing-for-2019-novel-coronavirus-in-suspected-human-cases-20200117>

Guidance for laboratories shipping specimens to WHO reference laboratories that provide confirmatory testing for COVID-19 virus

[https://apps.who.int/iris/bitstream/handle/10665/331639/WHO-2019-nCoV-laboratory\\_shipment-2020.3-eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/331639/WHO-2019-nCoV-laboratory_shipment-2020.3-eng.pdf)

## **TREATMENT**

Clinical management of severe acute respiratory infection when novel coronavirus (2019-nCoV) infection is suspected

[https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-\(nCoV\)-infection-is-suspected](https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(nCoV)-infection-is-suspected)

Home care for patients with suspected novel coronavirus (2019-nCoV) infection presenting with mild symptoms and management of contacts

[https://www.who.int/publications-detail/home-care-for-patients-with-suspected-novel-coronavirus-\(nCoV\)-infection-presenting-with-mild-symptoms-and-management-of-contacts](https://www.who.int/publications-detail/home-care-for-patients-with-suspected-novel-coronavirus-(nCoV)-infection-presenting-with-mild-symptoms-and-management-of-contacts)

COVID-19: Chloroquine and hydroxychloroquine research

<https://www.paho.org/en/documents/covid-19-chloroquine-and-hydroxychloroquine-research>

## **GLOBAL MONITORING OF COVID-19**

Global surveillance for COVID-19 caused by human infection with COVID-19 virus

[https://www.who.int/publications-detail/global-surveillance-for-human-infection-with-novel-coronavirus-\(2019-nCoV\)](https://www.who.int/publications-detail/global-surveillance-for-human-infection-with-novel-coronavirus-(2019-nCoV))

Revised case report form for Confirmed Novel Coronavirus COVID-19 (report to WHO within 48 hours of case identification)

<https://apps.who.int/iris/bitstream/handle/10665/331234/WHO-2019-nCoV-SurveillanceCRF-2020.2-eng.pdf>

## **DISCHARGE OF RECOVERED PATIENTS**

Clinical management of severe acute respiratory infection when novel coronavirus (2019-nCoV) infection is suspected

[https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-\(nCoV\)-infection-is-suspected](https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(nCoV)-infection-is-suspected)

New coronavirus (SARS-CoV-2) Discharge criteria for confirmed COVID-19 cases – When is it safe to discharge COVID-19 cases from the hospital or end home isolation?

<https://www.ecdc.europa.eu/sites/default/files/documents/COVID-19-Discharge-criteria.pdf>

## **CONSIDERATIONS IN INVESTIGATION AND IN HEALTH SERVICES**

Considerations in the investigation of cases and clusters of COVID-19

<https://www.who.int/publications-detail/considerations-in-the-investigation-of-cases-and-clusters-of-covid-19>

Operational considerations for case management of COVID-19 in health facility and community

[https://apps.who.int/iris/bitstream/handle/10665/331492/WHO-2019-nCoV-HCF\\_operations-2020.1-eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/331492/WHO-2019-nCoV-HCF_operations-2020.1-eng.pdf)

Reorganization and Progressive Expansion of Health Services for the Response to the COVID-19 Pandemic

<https://www.paho.org/en/documents/reorganization-and-progressive-expansion-health-services-response-covid-19-pandemic>

Severe Acute Respiratory Infections Treatment Centre

<https://www.who.int/publications-detail/severe-acute-respiratory-infections-treatment-centre>

COVID-19 v4. Operational Support & Logistics. Disease Commodity Packages

[https://www.who.int/docs/default-source/coronaviruse/dcp-ncov-v4.pdf?sfvrsn=f5fe6234\\_7](https://www.who.int/docs/default-source/coronaviruse/dcp-ncov-v4.pdf?sfvrsn=f5fe6234_7)

## **DEAD BODY MANAGEMENT**

Dead body management in the context of the novel coronavirus (COVID-19)

<https://www.paho.org/en/documents/dead-body-management-context-novel-coronavirus-covid-19>

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